

Part 3: 2006 and Later SORE Exhaust Standards

10/13/05

Outline

- 2006 and later emission standard changes
- 2007 and 2008 standards
- Additional changes to exhaust regulations
- Guidance and clarifications
- Application submittal
- Information and contact

2006 and Later Handheld Exhaust Emission Standards (Tier 3)

- Align with most stringent U.S. EPA HC+NO_x standard for engines < 50 cc
 - 50 g/kW-hr
 - 30% reduction from standard
 - California exhaust emission standards for displacement between 50 to 80 cc.

HC+NO _x :	72 g/kW-hr.
CO:	536 g/kW-hr.
PM:	2 g/kW-hr. (two-stroke engines only)

2006 Non-Handheld Exhaust Emission Standards (Tier 3)

- Exhaust emission standards
 - >80 - <225cc.

HC+NOx:	16.1 g/kW-hr
CO:	549 g/kW-hr, 2006+ MY
 - 225cc and above

HC+NOx:	12.1 g/kW-hr
CO	549 g/kW-hr, 2006+ MY

2007 and 2008 Non-Handheld Exhaust Emission Standards (Tier 3)

- Exhaust emission standards
 - >80 - <225cc: 10.0 g/kW-hr, 2007+ MY
 - 225cc and above: 12.1 g/kW-hr, 2007 MY
 - 225cc and above: 8.0 g/kW-hr, 2008+ MY
- Standards based on the use of a catalytic converter
- Manufacturer chooses technology to show compliance

Exhaust Emission Standards for Spark-Ignition Engines

(grams per kilowatt-hour)

MY	Displacement (cc)	Durability Period (hours)	HC+NO _x	CO	PM
2005 and Later	< 50	50/125/300	50	536	2.0
	50-80 inclusive	50/125/300	72	536	2.0
2006	>80 to < 225	125/250/500	16.1	549	
	≥ 225	125/250/500	12.1	549	
2007	>80 to < 225	125/250/500	10.0	549	
	≥ 225	125/250/500	12.1	549	
2008 and Later	>80 to < 225	125/250/500	10.0	549	
	≥ 225	125/250/500/1000	8.0	549	

Additional Amendments to Exhaust Regulations

- Alignment with U.S. EPA
 - < 25 hp vs. ≤ 19 kW
 - 1000 hour durability option
 - Test procedures
- Handheld limit raised to 80cc

Additional Amendments to Exhaust Regulations

(Continued)

- “Blue Sky” engine standards
 - Voluntary
 - HC+NO_x levels 50% of Tier 3 standard
 - Provides opportunity for clean label and incentives
 - Includes zero-emission engine eligibility

Additional Amendments to Exhaust Regulations

(Continued)

- Warranty Defects Reporting
 - Voluntary/Ordered Recall
 - Included in Exhaust and Evaporative Program
- No use of engine cooling during testing

SORE Exhaust Guidance and Clarifications

Confirmatory Testing

- Regulations provide authority to request Confirmatory Testing (CT)
- If a manufacturer submits only one certification test result, then CT is required if:
 - Certification level is $>85\%$ of the standard
 - CT result must be below the standard
- Example, if the standard is 16.1, then:
 - $16.1 \times 0.85 = 13.7$
 - CT done for certification levels above 13.7

Confirmatory Testing

(Continued)

- CT may be performed voluntarily by manufacturer without prior ARB notification
- All tests must be reported in the certification application

Auxiliary Engine Cooling Systems (AECS)

- Applicability - all new SORE engine families
- All current applications received must include the AECS questionnaire (available on ARB webpage)
- Evaluation of AECS is based on comparison to in-use operating conditions
- Manufacturers are encouraged to submit the AECS questionnaire prior to certification

Engine Family Name Carryover

- EF name must be updated on the emission label every year with the 2007 MY
- Verifying if products are legal for sale is difficult
 - Verification is delayed when serial number must be located on the engine for MY identification
 - ARB relies on accuracy and availability of mfr records

Engine Family Name Carryover

(Continued)

- New Evaporative requirements
 - Applicable engines/equipment require evap. labels with engine family name identified
 - Exhaust and Evaporative label can be combined

Tamper Resistance Method Review

- TRMs prevents unauthorized changes to engine manufacturer-certified calibrations
- Previously approved TRMs will be periodically reevaluated to assure their continued effectiveness
- Equipment Manufacturers may not modify engine calibration

Tamper Resistance Method Review

(Continued)

- Evaluation criteria includes but is not limited to:
 - need for special tools for access and/or adjustment
 - cannot be tampered using common tools
 - physical ease of access to the adjustable parameter
 - attempts to adjust parameter ineffective or result in unsatisfactory engine operation
 - physical device that controls the adjustable parameter (e.g. limiter caps)

Certification Application Submittal

- Letter of Intent
 - Pre-approval items may include:
 - Tamper resistance
 - Emissions label
 - Emissions warranty
 - Alternative test procedures request
- Cover letter/statements of compliance
- Application
 - Certification summary
 - Supplementary Information

Exhaust Guidelines and Information

- Small Off-Road Engine Resource Page

www.arb.ca.gov/msprog/OFFROAD/sore/sorectp/sorectp.htm

- Contact for exhaust certification:

Kumar Muthukumar, Manager

Off-Road Certification/Audit Section

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